



INDIAN MARITIME UNIVERSITY

(A CENTRAL UNIVERSITY)

B.Sc SHIP BUILDING AND REPAIR

FIRST SEMESTER EXAMINATION – JANUARY 2012.

BASIC ELECTRICITY AND ELECTRONICS

Time: 03 hrs

Max.Marks:75

Note:-

1. Non programmable scientific calculator is allowed
2. Question No.1 from Part A is compulsory and attempt any three from Part B

**Part – A (6x5=30)**

- 1) a) Explain common base connection with input and output characteristics  
b) Explain the construction and working of SCR.  
c) With the help of energy band diagram, explain insulators, conductors and semi conductors.  
d) What are the different types of emission? Describe in detail.  
e) What are the various types of losses in a dc machine?  
f) What are the different types of three phase induction motor, based on motor construction?

**Part – B (3x15=45)**

- 2) Explain the different methods of starting squirrel cage induction motor.
- 3) a) Explain the power stages and condition for maximum power for a dc motor.  
b) A 220V dc motor takes a full load armature current of 25A and no load current of 5A. Find the change in back emf from no load to full load, if the armature resistance is 0.5  $\Omega$ .
- 4) a) With the neat diagram, explain the working of UJT with equivalent circuit.  
b) The intrinsic stand – off ratio for a UJT is determined to be 0.6. If the inter-base resistance is 10k $\Omega$ , what are the values of  $R_{B1}$  and  $R_{B2}$ ?
- 5) a) What are the different types of dc generators? Explain with neat diagram.  
b) The output of shunt generator is 450A at 250V. If the armature resistance is 0.04 $\Omega$  and shunt field resistance is 50 $\Omega$ , what is the generated emf.
- 6) a) Explain synchronization and parallel operation of alternators using any one method.  
b) With a neat sketch, explain the working of:  
i) Centre-tap full wave rectifier.  
ii) Full wave bridge rectifier.

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FITTING TOOLS

Time: 3 hrs

Max.Marks:75

Note:-i). Answer Any Six Full Questions.

ii) Question Number 1 is compulsory and carries 15 marks and other questions carry 12 marks each.

1. a) What activities are done in bench fitting section? With sketch show nomenclature of a file  
b) When tapping is employed? Explain the procedure.  
c) List the work holding devices of fitting section and give the sketch of bench vice.
2. a) Where Jig and Fixture are used. Write the advantage of using Jig and Fixture.  
b) Differentiate Jig and Fixture with sketches, one number each.
3. Write the process of making Pig iron and Cast iron.
4. With neat sketches explain the working of the following
  - a) Vernier caliper
  - b) Vernier height gauge
  - c) Feeler gauge
5. What are the different types of accidents that take place in a workshop? How the accidents can be prevented?
6. a) What are the different standards of limits and fits?  
b) Differentiate clearance fit and interference fit.
7. a) Explain the process of soldering. What is the difference between soft soldering and hard soldering?  
b) Where brazing is employed? Explain the process.
8. Write short notes on:
  - a) Shaping Machine
  - b) Limit gauges
  - c) Copper
  - d) Honing

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BASIC HYDRAULICS AND PNEUMATICS

Time:03 hrs

Max.Marks:75

Note:-

Non programmable scientific calculator, is allowed

**PART -A**

**(Answer all questions) (6\*5 =30 Marks)**

1. Explain how fluids are classified. Using stress-strain diagram explain the behavior of fluids.
2. What is the effect of temperature on viscosity of water and that of air?
3. Define the terms surface tension and capillarity.
4. Explain how pressure can be measured with the help of U-tube differential manometer.
5. Explain the terms Buoyancy, Center of Buoyancy, Metacenter and Metacentric height.
6. Explain with a sketch the working of a Hydraulic accumulator.

**PART-B**

**(Answer any five questions) (5\*9 =45 Marks)**

7. An orifice meter with orifice diameter 15cm is inserted in a pipe of 30cm diameter. The pressure difference measured by a mercury oil differential manometer on the two sides of the orifice meter gives a reading of 50cm of mercury. Find the rate of flow of oil of specific gravity 0.9 when the co-efficient of discharge of meter is 0.64
8. What is a pitot-tube? With the help of a neat sketch explain how pitot-tube can be used to find the velocity at any point in the fluid
9. Explain the different types of fluid flow
10. Explain the difference between notches and weirs. How are they classified?
11. a) What are chemical dryers? What are the common methods for regeneration?  
b) Explain FRL unit.
12. a) What are the differences between an electrical motor and an air motor?  
b) What is a time delay valve? Sketch a circuit including time delay valve.
13. a) Give any three methods with required pneumatic circuit diagrams so that the exhaust is achieved.  
b) Explain the working of an air filter

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Time: 3 hrs

Max.Marks:75

ENGINEERING DRAWING

Note:-i). Answer Any Six Full Questions.

ii) Question Number 1 is compulsory and carries 15 marks and other questions carry 12 marks each.

iii) Non programmable Scientific Calculator can be used

- Draw a line segment of 110 mm and divide in the ratio 2:4:5 & measure each part.
  - How will you represent the following line in a drawing?  
i) Dimension Line    ii) Centre Line    iii) Visible Outline
  - Show the symbols used for First angle projection and third angle projection.
- The distance between the centre of a two circles 60 mm and 50 mm diameters is 80 mm. Draw an arc of radius 80mm touching the circles externally.
  - A, B and C are three corners of a triangle such that AB = 25 mm, BC = 28 mm, and CA=50mm. Draw a circle passing through A, B and C.
- One focus of an ellipse is at a distance of 40 mm from its directrix. Draw the ellipse, given the eccentricity is  $\frac{2}{3}$ . Draw a tangent and normal at a point 25 mm from the centre of the ellipse.
- Draw an epicycloids having a generating circle of diameter 50 mm which rolls outside the base circle of diameter 150 mm for one revolution. Also draw a tangent and normal to any point P on the curve.
- Draw an involute of regular pentagon of 30 mm side.
  - Draw the projection at a point A situated 25 mm above H.P and its top view is 30 mm below X-Y line. Draw its projection. State the quadrant where point lies.
- A line AB 40 mm long is parallel to HP and perpendicular to VP. Point A is nearer to VP and is 30 mm above HP and 20 mm in front of VP. Draw its projections.
  - Draw the front view and Top view of a square lamina of side 40mm which is parallel to VP and at a distance of 20mm from VP and perpendicular to HP with one edge resting on HP.
- Draw the Isometric view of a square prism side of base 40m and 75mm long where the axis of the prism is    i) Vertical    ii) Horizontal.



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MATHEMATICS

TIME:03 hrs

Max.Marks:75

Note:-

1. Non programmable scientific calculator is allowed
2. Question No.1 from Part A is compulsory and attempt any three from Part B

Part – A (6x5=30)

1. a) Solve the equation  $x^4 - 5x^2 + 4x + 20 = 0$ , has two roots which are equal in magnitude and opposite in sign.  
b) If  $A+B+C=\pi$ , prove that  $\sin A + \sin B - \sin C = 4 \sin A/2 \sin B/2 \cos C/2$ .  
c) If  $x^y = e^{y \log x}$ , show that  $\frac{dy}{dx} = \frac{\log x}{(1 + \log x)^2}$   
d) Evaluate:  $\int \frac{x^2}{(x+2)^2 (x+1)} dx$   
e) State the laws of friction.  
f) Explain moment of a force, its types and state the conditions for equilibrium.

Part – B (3x15=45)

- 2) a) Find the area enclosed between one arch of a cycloid  $x = a(\theta - \sin \theta)$ ,  $y = a(1 - \cos \theta)$  and its base.  
b) A copper rod of diameter 1cm and length 8cm is drawn into a wire of length 18m of uniform thickness. Find the thickness of the wire.  
c) Two vertical lamp posts of equal heights stand on either side of a roadway which is 50m wide. At a point on the roadway between the lamp posts, the elevation of the tops of the lamp posts, are  $60^\circ$  and  $30^\circ$ . Find the height of each lamp post, and the position of the point.



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ENGLISH AND ETHICS

Time:03 hrs

Max.Marks:75

(Answer All Questions)

SECTION A (6X5 = 30 Marks)

1. Insert 'a little' or 'the little' whichever is suitable.
  - (i) ----- grain was damaged by sea water.
  - (ii) ----- precaution is necessary in handling that machine.
  - (iii) ----- care could have prevented the catastrophe.
  - (iv) ----- influence that he has, he uses to his best advantage.
  - (v) ----- knowledge of French that he has is likely to be very useful to him on the Continent.
  
2. Complete the following sentences by filling in 'a' or 'an' or 'the' as may be suitable.
  - (i) Copper is ----- useful metal.
  - (ii) He is not ----- honourable man.
  - (iii) ----- able man has not always a distinguished look.
  - (iv) ----- reindeer is a native of Norway.
  - (v) Honest men speak ----- truth.
  
3. Do as directed.
  - (i) He said to me, "What are you doing?" ( Change into Indirect Speech)
  - (ii) He finished his exercise and put away his books. ( Change into Simple Sentence)
  - (iii) Lead is the heaviest of all metals. ( Change into Comparative Degree)
  - (iv) It *costs* twelve rupees. ( Replace the noun in italics by verbs)
  - (v) I would rather die he exclaimed than join the oppressors of my country.  
(Punctuate)
  
4. Fill in the blanks with suitable preposition.
  - (i) He has not yet recovered ----- his illness.
  - (ii) God is good ----- me.
  - (iii) The public are cautioned ----- pickpockets.
  - (iv) There is nothing new ----- the sun.
  - (v) This is a matter ----- little importance.

5. How would you develop an opinion about a subject given to you?
6. What is the positive side of failure?

**SECTION B (45 Marks)**

7. Write a letter to the Superintendent of Police of your district complaining about poor patrolling by the police in your area resulting in petty crimes. Sign yourself ABC. 5
8. Expand *A stitch in time saves nine*. 5
9. **Develop the following outline with a title into a well-knit story.** 5

Tiger kills an Indian lady travelling through the jungle- as he eats her body, he notices her gold bangle- keeps it as he thinks it may be useful- later he hides himself by a pool- traveller comes to pool, dusty and tired- strips and bathes in cold water- sees the tiger in bushes watching him- terrified- tiger greets him with a mild voice- says he is pious and spends time in prayer- as a sign of goodwill, offers the traveller the gold bangle- traveller's greed overcomes his fear- crossed pool to take bangle- tiger springs on him and kills him.

10. **Summarize the following passage into one third of it without changing the basic idea.** 5


Over-eating is one of the most wonderful practices among those who think that they can afford it. In fact, authorities say that nearly all who can get as much as they desire, over-eat to their disadvantage. This class of people could save a great more food than they can save by missing one meal per week and at the same time they could improve their health.

A heavy meal at night, the so-called "dinner", is the fashion with many and often it is taken shortly before retiring. It is unnecessary and could be forgone, not only once a week but daily without loss of strength. Three to five hours are needed to digest food. While sleeping, this food not being required to give energy for work, is in many cases converted into excess fat, giving rise to over-weight. The evening meal should be light, taken three or four hours before retiring. This prevents over-eating, conserves energy and reduces the cost of food.

11. **Read the following passage and answer the questions given.** 3

Today we know about each and every part of the world. There is no land or sea that is not known to us. Man has explored every corner of the world, and he knows all the ways and routes from anywhere to everywhere in the world. He can reach from one place to the other as safely, easily and quickly as he likes. He has maps to guide him and fastest means of transport to carry him.

But for ages, most of the world was unknown to man. To begin with, he lived in caves. Then he came out of caves and started making homes in little corners of forests or behind the hills. He was afraid of wild animals as also of the clouds and the winds. He offered prayers and sacrifices to Gods who, he thought, controlled the clouds and the winds. But slowly, through long centuries, men began to explore what lay beyond their caves, hills and forests where they had their homes. They went in their boats, first on the rivers and



then across the seas. At first they remained close to the shore, and each new voyager went a little further than the previous one.

To those early travellers, the earth seemed to be a vast, flat world. They feared what would happen if they reached the edge. They believed that if they sailed southward, the sea would become so hot and boiling that life would be impossible. Toward the north, they thought, it must be too cold for anything to live. Till only five hundred years ago, nearly all men believed this. When some Portuguese explorers began to sail southward, their seamen revolted and refused to go further. They believed that the steaming waters of the southern seas would boil them like potatoes. When some clever men of those days said that earth was not flat but a ball or sphere, people would laugh at them. 'How could there be people or trees on the other side of the world?' they would say. 'Would men walk and trees upside down? And how could they stay on the other side? Surely they would fall off.'

But now we know that those clever men were right. The earth is a ball, yet people on the other side do not fall off; they live just as we do. They walk upside-up and not upside-down. Our earth is like a great magnet. It draws all things towards itself. Wherever a man may be on this earth, he feels that towards the earth it is 'downside' and away from the earth it is 'upside'.

In ancient times many Greeks, Chinese, Arabs, Indians and others made voyages of discovery. But much of the world still remained unknown. They had no clear idea of the size and shape of the earth. About five hundred years ago men were again filled with a desire to make voyages of discovery. They wanted to find out the unknown oceans and lands which stretched around them on every side. Explorers set out from Portugal, Spain, France, Holland and England. They gradually discovered the other continents on this earth.

- (i) Where did men in ancient times build their homes and why?
- (ii) Why were sacrifices offered to God?
- (iii) What did the early sailors think about the northern and southern 'ends' of the world?

12. Write an essay on *The Growing Evil of Drug Addiction among the Youth*. Write your essay in about 100-150 words. 5

13. Use the following words in sentences 3

- (i) Corruption
- (ii) Frequent
- (iii) Responsibility

14. As an employee, you have monthly fixed income. How will you save money to buy a house? 14

OR

What qualities make an efficient employee?

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